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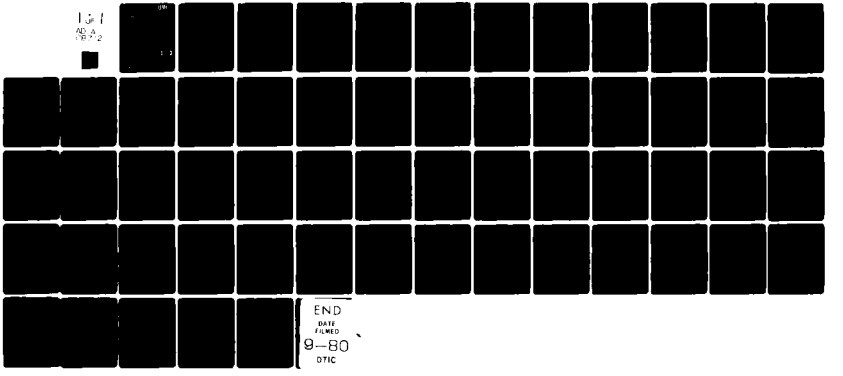
THE CCTC QUICK-REACTING GENERAL WAR GAMING SYSTEM (QUICK), USER--ETC(U)
APR 80
UNCLASSIFIED CCTC-CSM-UM-9-77-VOL-4-CH NL



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30 April 1980

TO: RECIPIENTS

SUBJECT: Change 2 to Users Manual CSM UM 9-77, Volume IV, Sortie Generation Subsystem

1. Insert the enclosed change pages and destroy the replaced pages according to applicable security regulations.

2. A list of Effective Pages to verify the accuracy of this manual is enclosed. This list should be inserted before the title page.

3. When this change has been posted, make an entry in the Record of Changes.

FOR THE DIRECTOR:

32 Enclosures
Change 2 Pages

J. DOUGLAS POTTER
Assistant to the Director
for Administration

The CCTC Quick-Reacting General War Gaming System (QUICK), User's Manual. Volume IV. Sortie Generation Subsystem. Change 2.
CCTC-CSM-UM-9-77-VOL-4-CHG-2

DISTRIBUTION STATEMENT A
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EFFECTIVE PAGES - APRIL 1980

This list is used to verify the accuracy of CSM UM 9-77 Volume IV after change 2 pages have been inserted. Original pages are indicated by the letter 0, change 1 pages by the numeral 1 and change 2 pages by the numeral 2.

Page No.	Change No.	Page No.	Change No.
Title Page	0	81.1-81.2	2
ii-v	2	82-90	0
vi-vii	0	91	2
viii	2	92-93	0
1	2	94-95	2
1.1-1.2	1	96-111	0
2	2	112-113	1
3-4	0	114-114.1	2
5-9	1	114.2	1
~~10~~	~~2~~	115-116	2
11-12	1	117	0
13-14	0	118	2
15	2	119-124	0
16	1	125	2
17	0	126-128	0
18	2		
19	0		
20-20.4	2		
21-22	2		
23-42	0		
43	2		
44-49	0		
50	2		
51	0		
52	2		
53-72	0		
73-73.1	2		
73.2	1		
74-76	2		
77-78	0		
79-79.1	2		
79.2	1		
80-81	2		

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CONTENTS

ILLUSTRATIONS

ABSTRACT

The computerized Quick-Reacting General War Gaming System (QUICK) will accept input data, automatically generate global stragetic nuclear war plans, provide output summaries, and produce input tapes to simulator subsystems external to QUICK. QUICK has been programmed in FORTRAN for use on the CCTC HIS 6000 computer system.

The QUICK Users Manual consists of four volumes: Volume I, Data Management Subsystem; Volume II, Weapon/Target Identification Subsystem; Volume III, Weapon Allocation Subsystem; Volume IV, Sortie Generation Subsystem. The Users Manual complements the other QUICK Computer System Manuals to facilitate application of the war gaming system. This volume, Volume IV, provides detailed instructions for execution of the Sortie Generation subsystem and the modules it comprises. Companion documents are:

a. PROGRAM MAINTENANCE MANUAL
   Computer System Manual CSM MM 9-77, Volume I
   Computer System Manual CSM MM 9-77, Volume II
   Computer System Manual CSM MM 9-77, Volume III
   Computer System Manual CSM MM 9-77, Volume IV
   Provides detailed instructions for maintenance of the system

b. TECHNICAL MEMORANDUM
   Technical Memorandum TM 153-77
   Provides a nontechnical description of the system for senior management personnel.

SECTION 1. GENERAL

1.1 Purpose

This volume of the QUICK Users Manual is intended to inform the user/analyst on how to prepare control cards; structure execution (run) decks; prepare computer job requests; and understand the associated computer output, to include the recognition of error messages for the Sortie Generation subsystem of QUICK. It complements information contained in the Maintenance Manuals on the QUICK System.

1.2 General Description

The Sortie Generation Subsystem operates using the integrated data base as developed by the Weapon Allocation subsystem and produces detailed bomber and missile (delivery vehicle and weapon) sortie specifications. Thus, it accepts a near-optimal weapon allocation, and from this as well as consideration of delivery vehicle characteristics and other factors, generates a detailed plan of attack for one opposing side in a hypothetical general war.

The subsystem consists of modules FOOTPRNT, MIRVDUMP; POSTALOC, PLANOUT and PLOTIT as shown in figure 1. Figure 2 shows the relationship of the Sortie Generation subsystem to other QUICK subsystems in terms of procedural information flow.

In addition to the plan generation requirements, per se, the output of this subsystem is utilized alternatively by:

a. Damage Assessment systems external to QUICK which utilize weapon/target strike data (DGZ tapes) as required.

b. General War simulation models external to QUICK (e.g., NEMO and ESP) which utilize relevant strike data as required (DGZ and A/B tapes).

If any missile delivery vehicles exist within the data base, module FOOTPRNT must be executed. For single RV missile delivery systems individual sorties are simply formatted; no other action is required. For MIRV weapon groups detailed reentry vehicle target point assignments which satisfy the various constraints are created. MIRVDUMP processes footprints developed by FOOTPRNT. The module determines alternate impact points for weapons from the same MIRVed sortie and with the same impact points.

POSTALOC processes bomber weapon groups and develops specific bomber sorties.

All weapon groups are processed only if the attack posture indicator (attribute ATTPOS) equals zero. Otherwise only those weapon groups are processed where attack increment (attribute ATTINC) equals ATTPOS.

The sortie plans at this point are neither fully detailed nor in the format required for input to simulator external to the QUICK system. Module PLANOUT therefore adds the required data, e.g., timing information and bomber serial constraints, and creates tapes for external simulators.

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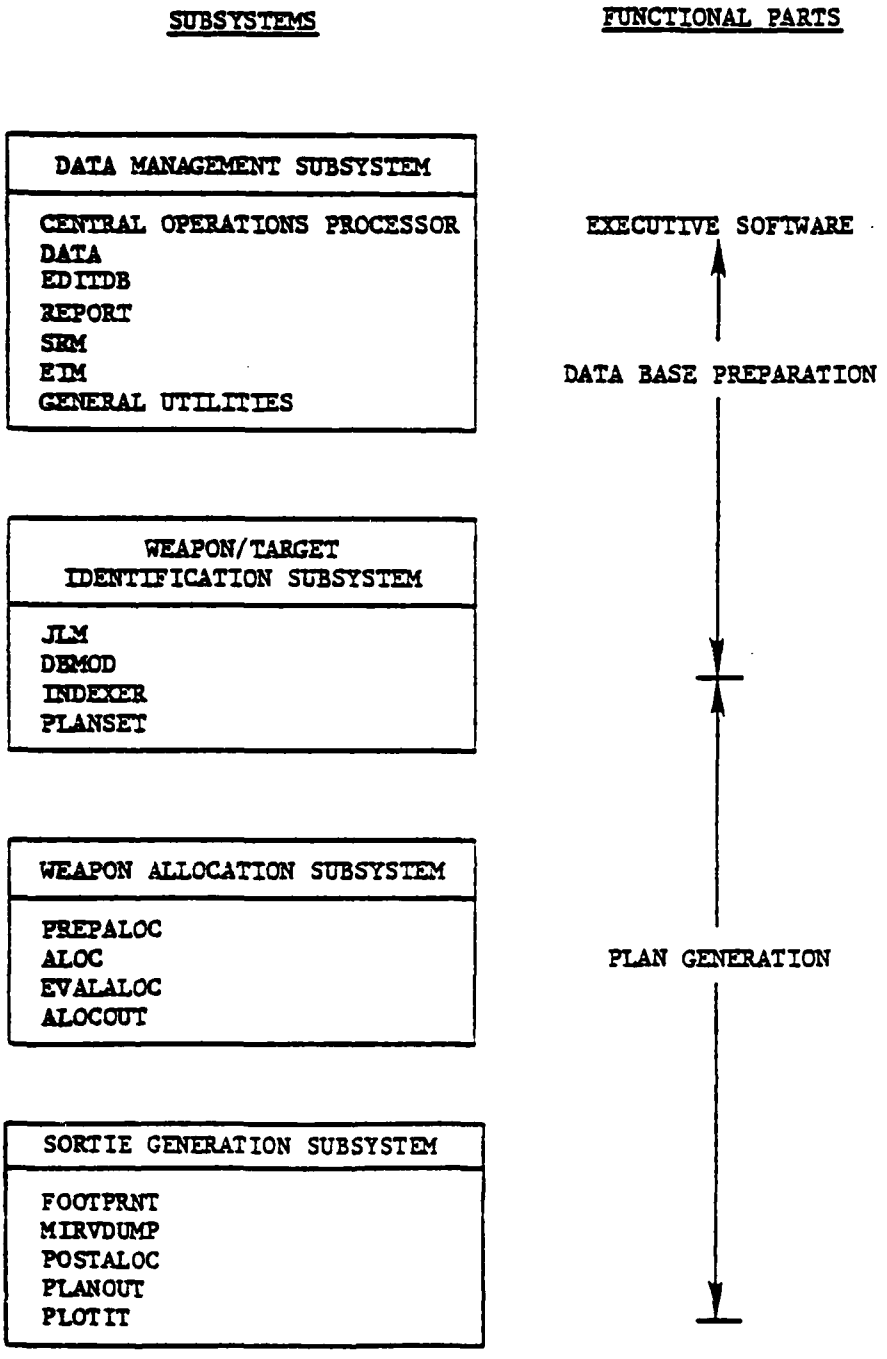
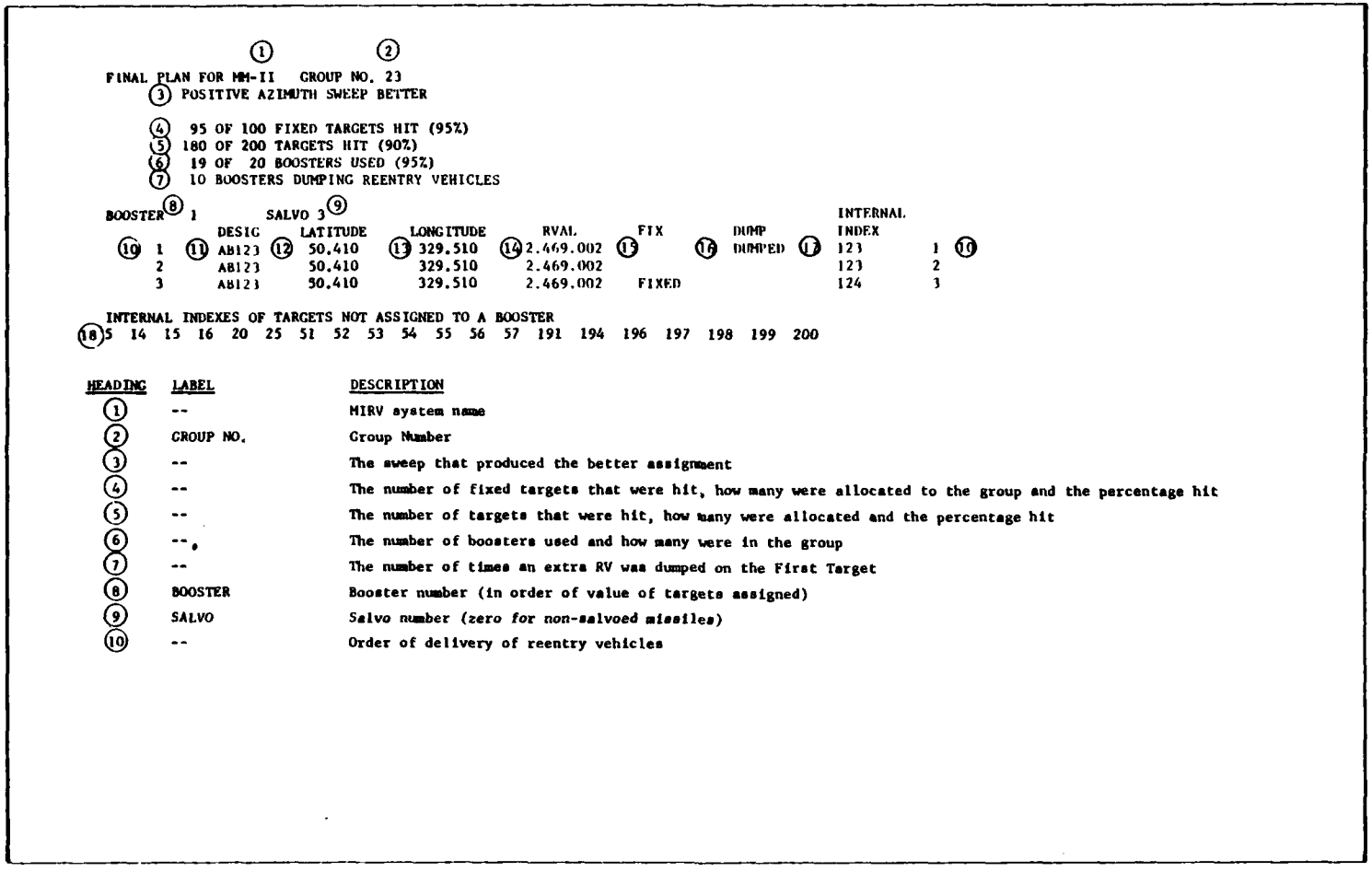


Figure 1. Major Subsystems of the QUICK System



(1) (2)

FINAL PLAN FOR MM-II GROUP NO. 23

(3) POSITIVE AZIMUTH SWEEP BETTER

(4) 95 OF 100 FIXED TARGETS HIT (95%)
(5) 180 OF 200 TARGETS HIT (90%)
(6) 19 OF 20 BOOSTERS USED (95%)
(7) 10 BOOSTERS DUMPING REENTRY VEHICLES

BOOSTER (8) 1 SALVO 3 (9)

	DESIG	LATITUDE	LONGITUDE	RVAL	FIX	DUMP	INTERNAL INDEX	
(10) 1	(11) AB123	(12) 50.410	(13) 329.510	(14) 2.469.002	(15)	(16) DUMPED	(17) 123	1 (10)
2	AB123	50.410	329.510	2.469.002			123	2
3	AB123	50.410	329.510	2.469.002	FIXED		124	3

INTERNAL INDEXES OF TARGETS NOT ASSIGNED TO A BOOSTER
(18) 5 14 15 16 20 25 51 52 53 54 55 56 57 191 194 196 197 198 199 200

HEADING	LABEL	DESCRIPTION
(1)	--	MIRV system name
(2)	GROUP NO.	Group Number
(3)	--	The sweep that produced the better assignment
(4)	--	The number of fixed targets that were hit, how many were allocated to the group and the percentage hit
(5)	--	The number of targets that were hit, how many were allocated and the percentage hit
(6)	--	The number of boosters used and how many were in the group
(7)	--	The number of times an extra RV was dumped on the First Target
(8)	BOOSTER	Booster number (in order of value of targets assigned)
(9)	SALVO	Salvo number (zero for non-salvoed missiles)
(10)	--	Order of delivery of reentry vehicles

Figure 5. Final Plan Print (Part 1 of 2)

HEADING	LABEL	DESCRIPTION
(11)	DESIG	Target designation
(12)	LATITUDE	Latitude of target
(13)	LONGITUDE	Longitude of target
(14)	RVAL	Target relative value (RVAL)
(15)	FIX	Fixed assignment indicator (FIXED for fixed assignment; blank otherwise)
(16)	DUMP	=DUMPED if an extra RV was dropped on this first target =INDEX if ALOC assigned more than one RV from the same weapon group
(17)	INTERNAL INDEX	The internal index (see (18)) of this target which was assigned to a booster
(18)	INTERNAL INDEXES	These are numbers, used internally by footprint, of the targets not assigned to any booster

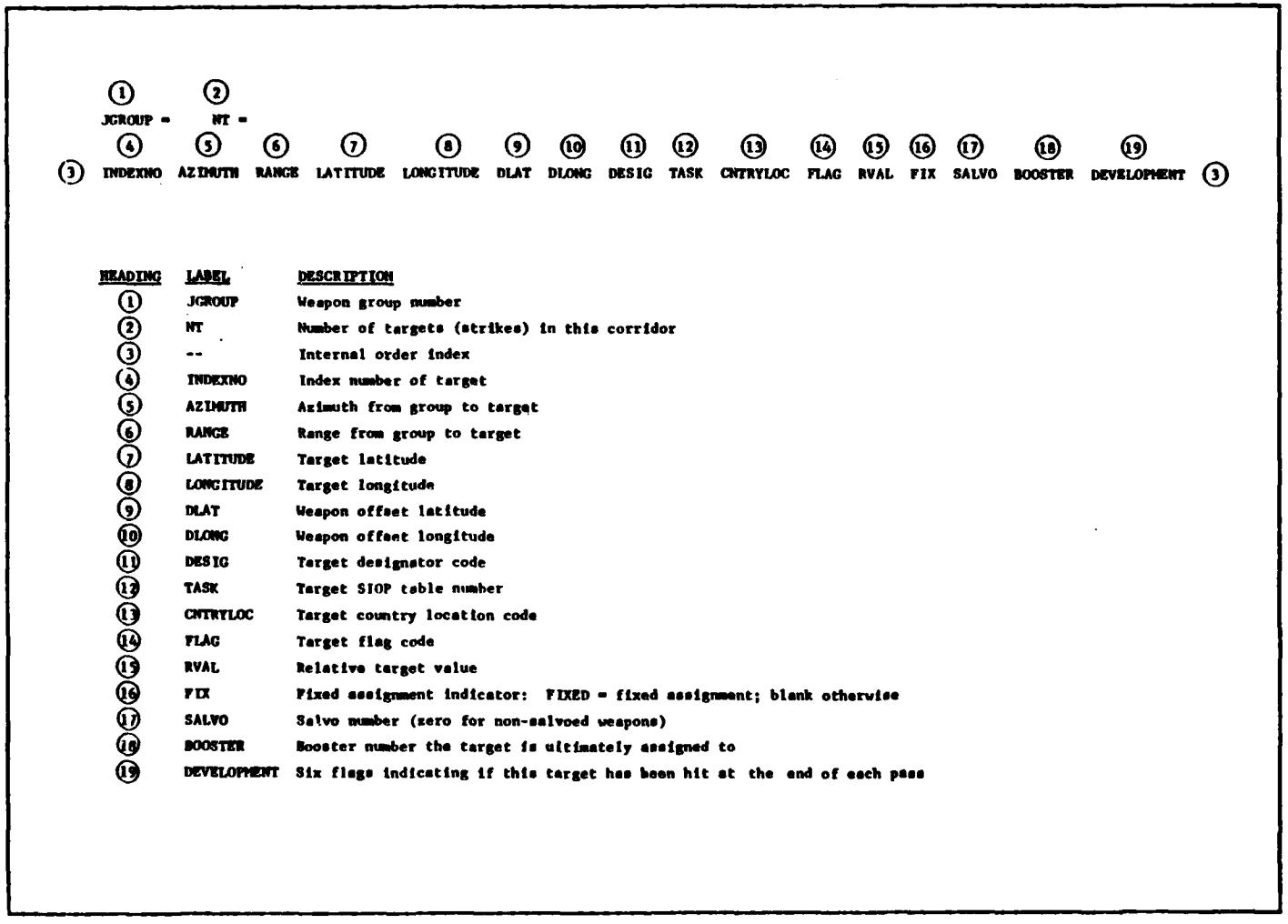
Figure 5. (Part 2 of 2)

CUMULATIVE STATISTICS FOR GROUP 97 (10)

SWEEP	PASS	TARGETS HIT FIXED	TARGETS HIT ALL	TARGETS HIT DUMPED	BOOSTERS USED	SELECTION OPTIMAL	FAILURES PASS/BRANCH	LEAD TGTS NO ELLIPSES
1	1	17	50	0	10	12	15	5
1	2	20	125	0	23	16	20	9
1	3	25	140	1	25	25	21	2
2	1	16	40	0	10	46	22	5
2	2	16	95	0	22	79	30	0
2	3	17	135	7	25	105	30	2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

HEADING	LABEL	DESCRIPTION
(1)	SWEEP	The positive or negative sweep for statistics
(2)	PASS	The current pass for statistics
(3)	FIXED	The number of fixed targets hit
(4)	ALL	The number of targets hit
(5)	DUMPED	The number of RVs dumped on first targets
(6)	BOOSTERS	The number of boosters used so far in the sweep
(7)	OPTIMAL	The number of times the optimal solution was not feasible
(8)	PASS/BRANCH	The number of times a collection failed due to an excessive number of passes or branches in PATHFIND
(9)	LEAD TGTS NO ELLIPSES	The number of lead targets that were unable to fill any ellipse
(10)	GROUP	The group described by these statistics

Figure 6. Group Assignment Summary



HEADING	LABEL	DESCRIPTION
①	JGROUP	Weapon group number
②	NT	Number of targets (strikes) in this corridor
③	--	Internal order index
④	INDEXNO	Index number of target
⑤	AZIMUTH	Azimuth from group to target
⑥	RANGE	Range from group to target
⑦	LATITUDE	Target latitude
⑧	LONGITUDE	Target longitude
⑨	DLAT	Weapon offset latitude
⑩	DLONG	Weapon offset longitude
⑪	DESIG	Target designator code
⑫	TASK	Target SIOP table number
⑬	CNTRYLOC	Target country location code
⑭	FLAG	Target flag code
⑮	RVAL	Relative target value
⑯	FIX	Fixed assignment indicator: FIXED = fixed assignment; blank otherwise
⑰	SALVO	Salvo number (zero for non-salvoed weapons)
⑱	BOOSTER	Booster number the target is ultimately assigned to
⑲	DEVELOPMENT	Six flags indicating if this target has been hit at the end of each pass

Figure 7. Input Target Print
(Group Optional Print 2)

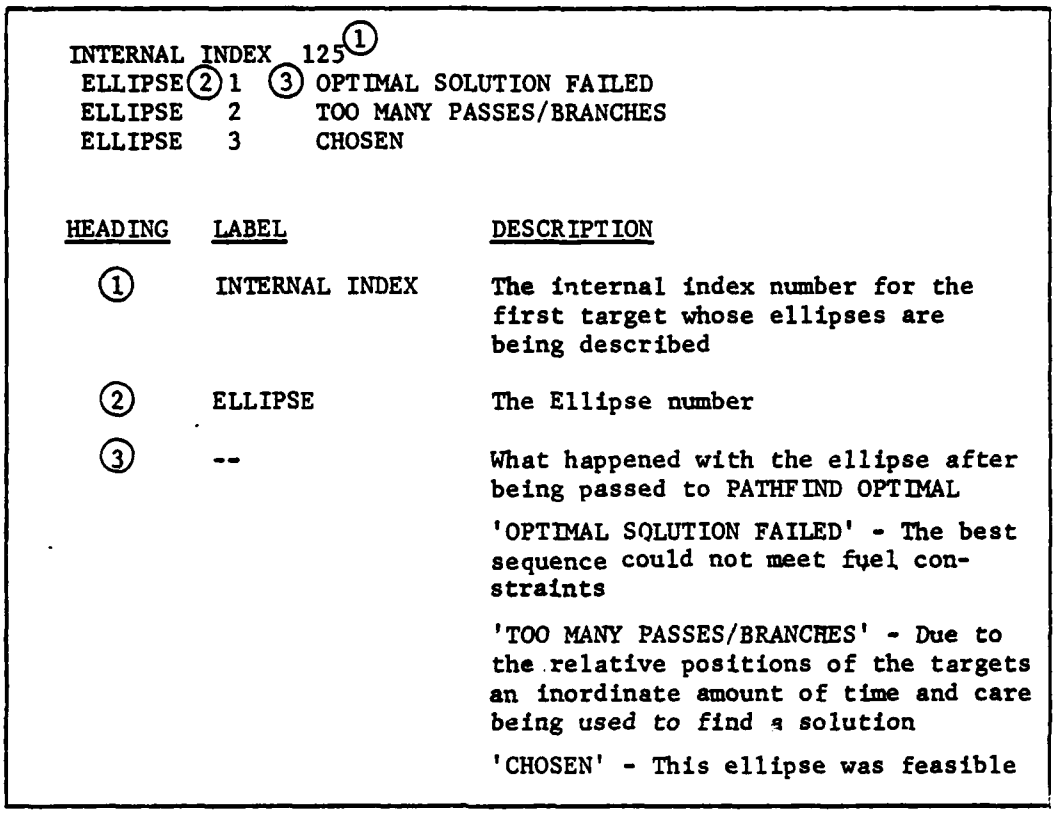


Figure 8. Results of Individual Target Processing

ONPRINTS CLAUSE ERROR IN FOOTPRINT
UNABLE TO FIND (A6) NUMBER
ATTEMPTING TO RECOVER

Could not find the Group, Sweep, Pass, Low Target or High Target in the print request. Missing *, /, (, or -.

MISSING (A10) AT (I4)

TOAS found a missing operator, variable or parenthesis at that location in the equation.

TOO MANY (A6) PARENTHESIS

Unbalanced left or right parenthesis

UNKNOWN EQUATION TYPE (A12)

Equation type does not describe a footprint constraint (UPTODOWN, CROSSTODOWN, FUELLOAD, FUELRATE, MAXRANGE, or RANGEXTEND).

(013) IS ILLEGAL OR MISPLACED ADVERB

Check spelling of input adverbs to FOOTPRNT

REEQUATE ERROR -- EQUATION NAMED (A,12) DOES NOT EXIST THE FOLLOWING EQUATIONS ARE IN THE DATA BASE ((10A12)

Attempting to reequate using a nonexistent equation. Only the equations in the list exist and can be used.

EQUATION NAMED (A12) ALREADY EXIST UNDER PAYTBLNM (A6)

There already is an equation with this name under another payload.

LIKE PHRASE MISSING

Check syntax reequate needs an equation to reequate.

ITEM (10I12)
ERROR (10I12)

These items are listed with the equation print and will pinpoint where the error occured in the equation.

FOOTPRNT TERMED ABNORMALLY - RAIDATA OVERFLOWING

More than 1500 strikes in a group

Figure 9. FOOTPRNT Error Messages

I1 MIRVDUMP MODULE

I1.1 General Purpose

MIRVed missile sorties which have more than one weapon impacting at the same point (dumping) are processed to determine alternate impact points. Three methods are used to select these new impact points. The first method examines up to 4,000 complexed and single point targets in the QUICK target base to determine if a subset of these targets can be found which is capable of being footprinted. This subset always contains the original targets for the sortie. If no suitable footprint is found using the nonfixed targets, the installations within the dumped target's complex are checked and, if a noncollocated installation is found, the weapon is placed on that installation. If there are not sufficient installations within the dumped target's complex (i.e., dumping occurred on a single point target) the other complexes attacked by this sortie are searched for installations which do not have a weapon impacting on them. Since weapons are assigned to these complexes in the original footprint, no checks are made to determine if the resultant aiming points can be footprinted. If new footprints can be formed, PLANOUT change cards (CCARDs) are output to modify the data base in a subsequent PLANOUT run.

I1.2 Input

All required data input to the MIRVDUMP module is contained in the integrated data base after the FOOTPRNT module has been executed. The verb required to execute the MIRVDUMP module is "MIRVDUMP". This verb will generate a request for an output file for the change cards. The file can be either a tape, a temporary file or a permanent file. The user must specify one of the three choices.

Optional inputs are available to set internal parameters in the model. These parameters affect the initial search area for locating the alternate impact points and the number of trials allowed to find a footprint. They are set by use of the $ SET JCL card. Switches 21, 22, 23, 24 and 25 set the number of allowable trials at 250, 500, 750, 1,000 and 5,000 respectively. Setting switch 20 doubles the initial search area for alternate impact points. The default limit for the number of trials is 500. Increasing this limit or increasing the area will increase running time. However, it may yield a few more undumped footprints.

The number of targets considered by MIRVDUMP is restricted to 4,000. Subroutine TGTLIM in the UTILITY library has a common block, TGTLM, which contains the number of sets of DESIGs input and the pairs of DESIGs identifying targets to be omitted. The maximum number of sets that can be input is 30. The data set AB, AC, DE, EK, CC, CC will omit all targets whose DESIGs start with AB through AC, DE through EK and CC. The DESIGs to be omitted must be selected by the user and input by the maintenance programmer. If no inputs are made the first 4,000 targets will be used.

I1.3 Output

The output of MIRVDUMP consists of standard output and outputs related to data processing exceptions.

I1.3.1 Standard MIRVDUMP Output. The standard MIRVDUMP output is divided into two parts. The first standard report is shown in figure 9.1. A section of the report is generated for each group. Each subsection of the report contains data for one dumped footprint in the group. If new footprints containing only lead or single point targets were found by MIRVDUMP, these footprints (maximum of three) are printed. The first footprint found with the most unassigned targets (designated by a U suffix attached to the DESIG) is used for preparing a CCARD which can later be input directly to the PLANOUT module. An A suffix on the DESIG indicates that the target has other weapons assigned to it.

If no solution to the dumping problem is found using lead or single point elements, the installation within the dumped target complex are used as alternate impact points for the dumped weapons. Impact points selected in this manner are designated by attaching an S suffix to the reported DESIG. If the dumping problem is still not solved, the message UNABLE TO FIX THIS FOOTPRINT is displayed. This report is terminated by the statement "MIRVDUMP EXECUTION FINISHED" which indicates successful completion of the run.

The second standard report is a list of CCARDS produced by the module. These cards can be reviewed, modified if required, and then input directly to the PLANOUT module to implement the changes.

I1.3.2 Error Messages. A list of error messages produced by the MIRVDUMP module appears in figure 9.2. Except for the first message, where the number of trials can be set using the $ SET card, these messages indicate an overflow of array sizes or problems with the data base.

```
GROUP   7  MM-III

 FEASIBLE FOOTPRINTS FOR SORTIE NUMBER  134
NO FOOTPRINTS USING ONLY LEAD TARGETS
TARGETS USED TO PREPARE CCARDS ARE
 AB521   AB545   AB546S


 FEASIBLE FOOTPRINTS FOR SORTIE NUMBER  139
 AB278  AB115  AB262A
 AB278  AB115  AB096A
 AB278  AB115  AB128A
TARGETS USED TO PREPARE CCARDS ARE
 AB278   AB115   AB262A


 FEASIBLE FOOTPRINTS FOR SORTIE NUMBER  151
 AB119  AB126  AB049U
 AB119  AB126  AB063A
 AB119  AB126  AB056A
TARGETS USED TO PREPARE CCARDS ARE
 AB119   AB126   AB049U


 FEASIBLE FOOTPRINTS FOR SORTIE NUMBER  153
 AB118  AB067  AB294A
TARGETS USED TO PREPARE CCARDS ARE
 AB118   AB067   AB294A


 FEASIBLE FOOTPRINTS FOR SORTIE NUMBER  154
NO FOOTPRINTS USING ONLY LEAD TARGETS
UNABLE TO FIX THIS FOOTPRINT                ******
MIRVDUMP EXECUTION FINISHED
```

Figure 9.1. MIRVDUMP Sortie Print

```
FOOTPRINT SEARCH TERMINATED 500 TRIALS
POSSIBLE NULL SORTIE #767 GROUP 6 PROCESSING TERMINATED
TOO MANY RVS ON SORTIE 842
TARGET SEARCH TERMINATED - OVER 4000 TARGETS
TARGET SEARCH TERMINATED - NT = 1000
```

Figure 9.2. MIRVDUMP Error Messages

SECTION 3. POSTALOC MODULE

3.1 General Purpose

The purpose of module POSTALOC is the generation of detailed sortie specifications for bomber vehicles, and their weapons, based on the near-optimal weapon allocation received from the Weapon Allocation subsystem and consistent with user input weapon systems specifications and operational constraints. Module FOOTPRNT generates sorties for missiles systems in either single or multi-loads.

The main operation performed in module POSTALOC is the expanding of the allocation that was developed in module ALOC into a plan of sufficient detail to serve as input for module PLANOUT. The first step in the development of a flight plan is the combining of several strikes into a single feasible sortie. In addition, with each sortie are associated a launch base and a recovery base. Also a flight profile is selected which specifies where in the flight plan low altitude capability is to be utilized.

3.2 Input

The general form of the text English command for POSTALOC execution is:

POSTALOC SETTING { TARFAC / MUSTREC / VUNLOAD } = value [GRP, RATIO] =

(value , value) ,[(value , value) . . .]

[ONPRINTS print-option [(first-sortie] [- last-sortie]]

[* pass] [/ corridor] [, weapon group]

[print-option . . .] . . .

3.2.1 The SETTING Adverb. This adverb introduces a clause whereby parameters necessary for POSTALOC's execution may be defined. Definition of the processing parameters are:

TARFAC - A fraction by which the local attrition parameter will be multiplied

MUSTREC -- Used to specify the required recovery of the bombers. A value of zero implies the possibility of ditching aircraft; a value of one means all aircraft must be recovered

VUNLOAD - Significance parameter for final alterations in sortie. The significance parameter is the fractional change in

sortie value which must occur before the module will either have the bomber attack previously omitted targets with ASMs or will remove unprofitable bombs from the sortie plan. Recommended settings are values from .002 - .005.

GRP, RATIO - RATIO of recovery value to total sortie for bombers in GRP. An entry for RATIO with GRP set to 251 causes the indicated ratio to pertain to all unspecified weapon groups. Up to 250 sets of data (each separated by a blank) may be entered.

3.2.2 The ONPRINTS Adverb. This clause controls the user print requests and the frequency each report is to print. For any given execution of POSTALOC, up to 60 individual print requests may be honored. Each print request number indicates both the print required and the point during processing at which that print is to be output. For example, print 1 displays the contents of common /SORTYTGT/. If that print is to be output by subroutine SORTOPT, the user specifies print request number 31. If it is to be output by subroutine EVALB, it is effected by print request numbers 103, 104, 105, 106, 107, or 108; the one to be chosen depends on at what point within EVALB the print is to be issued. A list of print request numbers is given in table 3.

A print request number that stands by itself will produce output for all occurrences of the request. Provision is included to control the frequency of the prints by specifying sortie numbers, pass number, corridor index, and/or weapon group. A special operator (see example above of text input) introduces separate controls. If an operator is missing, default conditions occurs. Consider, an example:

ONPRINTS 75 11 (2-9) * 1/4, 10 18 (-5) 10,5

Print request 75 occurs with no restriction. Print request 11 is printed for weapon group 10, corridor 4, pass 1 and sortie between 2 and 9. Print 18 prints the first 5 sorties for all weapon groups and corridors. Print 10 will occur only for weapon group 5. Note that individual requests are separated by at least one space.

3.3 Output

3.3.1 Standard. The only standard output gives the number of sorties generated; the message is:

TOTAL NUMBER OF SORTIES = (I)

where I is the number of sorties.

All remaining prints must be user requested.

```
PRINT NO.  5 FROM POSTALOC
GRPDATA (1)        (2)          (3)          (4)       (5)       (6)       (7)
      IGROUP =  1  NWPNS =  60  NVEHGRP =  15  IREG =  1  ITYPE =  2  IALERT =  1  IREFUEL =  -5
   (8) YIELD =     1.750 (9) ISTART =  1 (10) NBASE =  1 (11) PAYLOAD = B-52
(12) IB         1
(13) IBASE   2136
(14) BLAT     40.5
(15) BLONG    91.5
```

HEADING	LABEL	DESCRIPTION
(1)	IGROUP	Group index
(2)	NWPNS	Total number of weapons in group
(3)	NVEHGRP	Number of vehicles in group
(4)	IREG	Region index
(5)	ITYPE	Type used in program ALOC
(6)	IALERT	Alert indicator, 1=alert, 2=nonalert
(7)	IREFUEL	Index of refueling area
(8)	YIELD	Average yield for group
(9)	ISTART	Starting weapon index
(10)	NBASE	Number of bases in group
(11)	PAYLOAD	Payload table name
(12)	IB	Base index
(13)	IBASE	Index number of base
(14)	BLAT	Base latitude
(15)	BLONG	Base longitude

Figure 21. Print Option 12: The Contents of Common /GRPDATA/

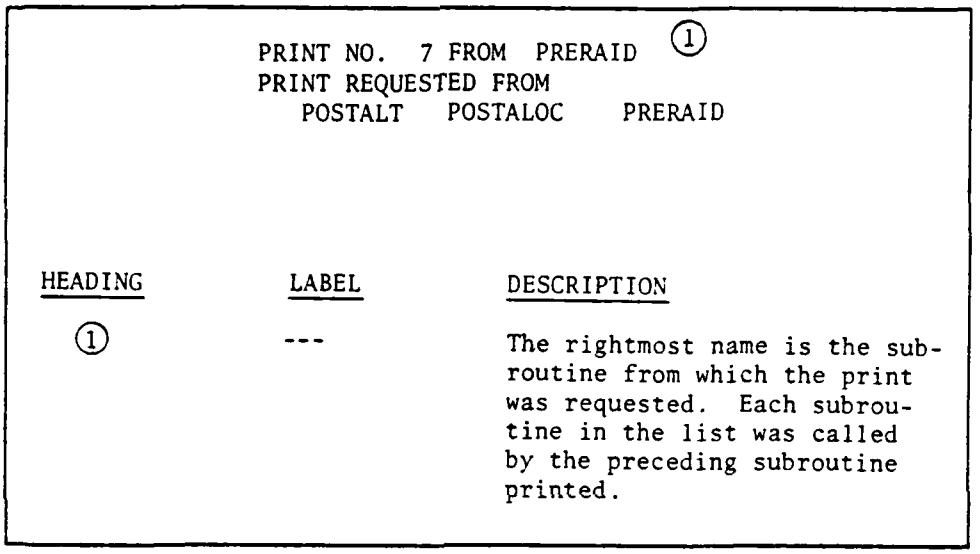
PRINT NO. 3 FROM PCSTALOC

CORRCHAR (1) NDATA = 20

(2) PCLAT	(3) PCLONG	(4) RPLAT	(5) RPLONG	(6) CRLENGTH	(7) NCRSTYLE	(8) ATTFCORR	(9) ATTRSUPP
50.0	350.0	0.0	0.0	0.0	1	1.000-003	3.000-004
50.0	350.0	0.2	0.2	0.0	5	1.000-003	3.000-004
55.0	215.0	62.0	172.0	0.0	4	3.000-004	1.000-004
60.0	230.0	68.0	199.0	507.2	4	3.000-004	1.000-004
50.0	235.0	40.0	227.0	0.0	4	3.000-004	1.000-004
40.0	243.0	36.0	236.0	0.0	4	3.000-004	1.000-004
60.0	275.0	73.0	275.0	0.0	2	6.000-004	0.000+000
52.0	340.0	52.5	349.0	206.4	4	1.000-003	3.000-004
50.0	330.0	43.0	342.0	0.0	4	1.000-003	3.000-004
50.0	325.0	43.0	325.0	0.0	4	1.000-003	3.000-004
60.0	310.0	71.0	330.0	0.0	4	1.000-003	3.000-004
55.0	325.0	60.0	340.0	0.0	4	1.000-003	3.000-004

(10) ENTLAT	(11) ENTLONG	(12) MILCATTR	(13) DEFRANGE	(14) NPRCRDEF	(15) DEFDIST(3)			(16) ATTRPRE(3)		
0.0	0.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
0.0	0.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
62.0	172.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
72.0	177.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
40.0	227.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
36.0	236.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
73.0	275.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
55.0	353.0	2.000-001	250.0	1	206.4	0.0	0.0	1.032-002	0.000+000	0.000+000
43.0	342.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
43.0	325.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
71.0	330.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000
60.0	340.0	2.000-001	250.0	0	0.0	0.0	0.0	0.000+000	0.000+000	0.000+000

Figure 22. Print Option 13: The Contents of Common /CORRCHAR/ (Part 1 of 2)



HEADING	LABEL	DESCRIPTION
①	---	The rightmost name is the subroutine from which the print was requested. Each subroutine in the list was called by the preceding subroutine printed.

Figure 26. Print Option 18: The Contents of Common /DEBUG/

```
PRINT NO. 76 FROM OUTSRT

OUTSRT
 (1)IOUTSRT =  4   MYGROUP =  1   MYCORR =  7   INDVEH =  2   JRFF =-5   JDPEN = 6   KPAYLOAD =  8   LNCHBASE = 2136
 (2)ITYP = 4   BASELAT =  40.5   BASELONG =  91.5   NMAP =  6   DSTLOW =   0.0   105.4   515.3
 (3)SPDLO = 480.0   SPDHI = 510.0   RANGE = 4800.0   HANGREF = 6300.0   DELAY =  0.00   IREG =   1   IALERT =  1
   (4)MAPTYPE   (5)OBLAT   (6)OBLONG   (7)DLAT   (8)DLONG   (9)IOBJECT DESIG TSK CL (13)F  (14)ATTROUT  (15)SURVOUT
 1   DOGLEG        73.0      275.0      0.000     0.000          7 (10)0000(11)00(12)00  00   0.0006   1.0000
 2   DROPBOMB      49.7      286.7      0.000     0.000       2802    A0672 114 UR  00      0.4000   0.8284
 3   DROPBOMB      45.1      294.0      0.000     0.000       2595    PF111 128 UR  00      0.0000   0.7892
 4   DROPBOMB      41.2      290.7      0.000     0.000       2171    AR157 131 UR  00      0.0000   0.7069
 5   DROPBOMB      38.5      293.2      0.000     0.000       2414    AD446 116 UR  00      0.0000   0.6271
 6   DEPE..         0.0        0.0      0.000     0.000          6    00000 000 00  00      0.0000   0.5359
```

HEADING	LABEL	DESCRIPTION
1)	IOUTSRT	Sortie index number
	MYGROUP	Group index
	MYCORR	Corridor index
	INDVEH	Index of vehicle on base
	IREF	Refuel index
	JDPEN	Depenetration index
	KPAYLOAD	Payload index
	LNCHBASE	Base index

Figure 27. Print Option 20: The Contents of Common /OUTSRT/ (Part 1 of 3)

HEADING	LABEL	DESCRIPTION
	ITYP	Weapon Type Name
	BASELAT	Base latitude
(2)	BASELONG	Base longitude
	NHAP	Number of happenings
	DSTLOW	I=1, Low-altitude range available for use before corridor origin (0). If bomber range is insufficient to hit even 1 target, DSTLOW(1) is less than 0 I=2, Low-altitude range available for use before first target I=3, Low-altitude range available for use after first target
	SPDLO	Speed at low altitude
	SPDHI	Speed at high altitude
	RANGE	Unrefueled range of vehicle
(3)	RANGREF	Refueled range of vehicle
	DELAY	Delay in launch times
	IREG	Region index
	IALERT	Alert status
(4)	HAPTYPE	Type of happening

Figure 27. (Part 2 of 3)

HEADING	LABEL	DESCRIPTION
⑤	OBLAT	Latitude of happening
⑥	OBLONG	Longitude of happening
⑦	DLAT	Offset latitude for complex target aim point
⑧	DLONG	Offset longitude for complex target aim point
⑨	IOBJECT	Place of happening
⑩	DESIG	Target designator code
⑪	TSK	SIOP table number
⑫	CL	Target country location code
⑬	F	Target flag
⑭	ATTROUT	Local attrition encountered
⑮	SURVOUT	Cumulative survival probability

Figure 27. (Part 3 of 3)

4.2.2.1 The CCARD Clause. This clause is used to change strikes within existing sorties. The general form is (see table 5):

CCARD sortie number, desig1, desig2 [+ hob, dec, rac, tchange, asm] [* caloff, dlatoff, dlongoff]

The first three parameters specify the action to be performed and must be entered for each adverb. The "sortie number" indicates which sortie is to be changed. Various modes of entries for the target DESIG's are:

- "desig1" will be dropped when "desig2" is blank (that is, a comma appears in lieu of a target DESIG)
- Strikes are replaced when both "desig1" and "desig2" are non-blank and not equal. "desig 1" will be replaced by "desig2" (and if a complex, it must be the representative target)
- When "desig1" equals "desig2", elements of the strike are changed. This allows a change in down time, height of burst, offset characteristics or depenetration corridor.

The user also has the option to substitute a numeric value for "desig1." This value is the sequential count of the strike to be changed. Thus if the strike is third in the order of the original sortie, the user may enter the value 3 in lieu of a target DESIG. This option allows the user to select among multiple occurrences of the same DESIG. The RVs should be deleted in reverse order (i.e., RV 3 should be entered before RV 2). Following "desig2" parameters that may be changed are optional. These options come in two collections. In each collection the individual parameters may be omitted but their preceding commas must still appear. The first collection contains the options of changing the height-of-burst, specifying a new depenetration corridor, suppressing recalculation of attrition, and altering the flight time. The second collection permits the definition of target offset. This collection must be introduced by the asterisk (*) operator. Also, if no options are used from the first collection default commas are not required. Similar logic applies if the fourth, or third and fourth, or second, third or fourth options are not employed.

If any of the change fields (tchange, hob, etc.) are omitted and the target is not changed, the current sortie values are used. When they are omitted for a new target, default values will be assigned. The defaults will use normal times derived from distances, hob as specified in module PREPALOC and zero offsets.

For time change requests, the time of the bomb or ASM hit will be changed by the time specified. In the case of missiles the downtime will be changed but there will be no change to launch times. If the target is new, then time change specifies the change to be applied to the calculated time.

The "tchange", "dlatoff" and "dlongoff" are assigned quantities. Offsets are always computed from the data base locations of target "desig2". DLATOFF and DLONGOFF are entered as degrees, minutes, seconds, direction or 0.

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Table 5. CCARD Clause

LABEL	RANGE	DESCRIPTION
sortie number	N/A	Sortie sequential number*
desig1	(DESIG** or comma)	DESIG1 reference*
desig2	(DESIG** or comma)	DESIG2 reference*
hob	(A, G or comma)	Height of burst option
dec	(1-30 or comma)	Depenetration corridor change for bomber or salvo number for missile
rac	(N or comma)	Attrition recalculation
tchange	(Minutes, seconds, or comma)	Time of flight change
asm	ASM	ASM indicator. If absent, strike is non-ASM
*** caloff	(C or comma)	If "C" follows the asterisk operator, dlatoff and dlongoff represents the actual ground zero. Otherwise, dlatoff and dlongoff represents offsets from the target
dlatoff	(Degrees, minutes, seconds, direction, or comma)	Dependent on 'caloff'. In either case units are degrees, minutes, seconds, direction (N or S) or 0
dlongoff	(Degrees, minutes, seconds, direction, or comma)	Same as 'dlatoff', but for longitude (direction (E or W))

* Items mandatory.

** Any data base target DESIG. If blank (see text) insert a comma.

*** 'caloff' must be introduced by the asterisk operator.

There are two methods of defining offsets: (1) direct offset entry if "caloff" does not equal "C"; and entry of actual ground zero if "caloff" equals "C". Note that an entry of 0 sets offsets to zero.

New attritions will always be calculated unless parameter "rac" equals "N".

Some examples of the CCARD are:

```
CCARD 14,BB123
CCARD 15,AA432,AA432,G,,,2750
CCARD 16,AA777,AA666,,2*,002000N,0001000E
```

The first example shows that for sortie number 14 the strike on BB123 is eliminated. In the second example, missile sortie number 15's strike on AA432 has its height of burst changed to ground and its time of impact changed to 27 minutes and 50 seconds.

The third example shows the AA777 for sortie number 16 replaced by a strike on AA666, depenetration using corridor 2 and appropriate offsets.

4.2.2.2 The ICARD Clause. This clause is used to insert a new strike in a sortie. The general form of the clause is:

ICARD sortie number , [desig1] , desig2 [, hob , dec , rac , tchange, asm] [* caloff , dlatoff , dlongoff]

"desig2" will be inserted after "desig1." If "desig1" is omitted (two commas after the sortie number), "desig2" will become the first target of the sortie. The discussion of optional information for the CCARD clause on new targets applies to "desig2."

The user may substitute a strike number for "desig1." If a value of zero (0) is entered, the new strike is inserted prior to the current first strike.

This option is used for air delivered ordnance and MIRV capable missiles. In the case of bombers it may be used in conjunction with CCARD clauses to change the order of strikes on a given sortie. However, if the program determines a switch in the order of strikes is not mathematically optimal, the changes will not be made.

An example is:

```
ICARD  15,AA432,BB123,,2
```

A strike on BB123 will occur after the strike AA432 and the depenetration corridor is changed to 2.

4.2.2.3 The ACARD Clause. This clause is used to add non-MIRV missile sorties. This clause has the general form:

ACARD desig, hob, group, siteind [, isal, tlaun]
[* caloff, dlatoff, dlongoff]

Generally, all comments concerning the CCARD clause applies to the ACARD clause. Note that no sequence number is supplied; PLANOUT will supply the correct value. DESIG must be either a lead DESIG or the DESIG of a noncomplexed target. "Group" is the weapon group number containing the launch base. "Siteind" is the INDEXNO of the site from the weapon group. "Isal" is the salvo number to be associated with the added sortie. If not input, "isal" will default to zero for nonsalvoed sorties and to one for salvoed sorties. "Tlaun" is the delay time, in hours, to be applied before launch of the sortie. For nonsalvoed sorties, the launch time is simply h-hour + "tlaun", assuming no MISTIME/MSLCOR clauses were input. For salvoed missiles, the launch time is h-hour + ("isal" -1) * LCHINT/60, + "tlaun". If simultaneous launches are desired for salvoed missiles, "isal" must be repeated for each round which is to be salvoed; i.e., if SIMLAUNCH is i, the missile salvo number j would be repeated i times in order to have i weapons launch at (j-1) * LCHINT/60 + "tlaun".

An example of an ACARD clause:

ACARD BB123,G,7,1374,3,.1*002000N,0000012W

This would cause a sortie to be added allocating group 7 from site 1374 to target DESIG BB123. A ground burst is desired, offset 20 minutes north and 12 seconds west of BB123. The launch will be delayed 6 minutes past h-hour and will occur in the third salvo. Assuming a launch interval of 2 minutes and no timing lines input, launch will occur 10 minutes after h-hour ((3-1)*.0333+.1=.1666 hours).

4.2.2.4 General Sortie Change Comments. Some changes will necessitate the recalculation of the survival probability, attrition, and available low altitude range of a mission. Such changes are the addition or deletion of targets from the original sortie. Other changes, such as changing the time between targets should, strictly speaking, affect the available low altitude range and survival probability also; however, if the adjustments are small enough the user may not want the whole sortie disrupted by these calculations. Thus, on time changes the user will be able to select whether recalculation is desired. The default will be to recalculate the basic parameters. Of course, if the user opts for recalculation at any change on a sortie, all events will be affected.

If a decrease in time has been input between strikes, the effect is to actually increase the speed of an aircraft. The actual speed will be calculated by dividing the distance by time between the two points and if this increase is greater than a data set percentage of the aircraft speed it will be considered to be an error. The time will be set to the maximum allowed time differential and an error message printed. The time error messages round down to the whole minute.

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
1	1		S	STRIKE Card indicator
2	2		1-9	Command/function code
3	3-7	SSSN	1-99999	Sortie Sequence Number
4	8-10	STSK	3 Numeric	SIOP Table Number
5	11-12	SDTM	01-31	Day (Of weapon detonation)
	13-14		00-23	Hour (Of weapon detonation)
	15-16		00-59	Minute (Of weapon detonation)
	17-18		00-59	Second (Of weapon detonation)
6	19-24	SLAT	DDMMSS	DD=degrees, MM=minutes, SS=seconds (Latitude of desired ground zero (DGZ))
7	25		N or S	North or South
8	26-32	SLON	DDDMMSS	DDD=degrees, MM=minutes, SS=seconds (Longitude of DGZ)
9	33		E or W	East or West
10	34-38	SDES	2 Alpha, 3 Numeric	Target designator code
11	39-40	SPLS	-1-99	PLS-Probability* of pre-launch survival
12	41-42	SPTP	-1-99	PTP-Penetration probability*
13	43-44	SWSR	-1-99	WSR-Weapon system reliability*
14	45	SREG	1-9	Region code
14	45	SREG	1-9	Region code

*A printed probability of -1 implies a value of 100.

Figure 42. STRIKE Tape Format (Part 1 of 3)

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
15	46-48	SFYR	000-999	Fission/yield ratio
16	49-53	SYLD	00001-99999	Yield (kilotons)
17	54-57	SHOB	0000-9999	Height of burst (tens of feet)
18	58-61	SCEP	0000-9999	CEP in thsnds of feet
19	62	SATT	0-9	Attack increment
20	63-64	SCLO	2 Alpha	Country code for target locations
21	65-66	SCOW	2 Alpha	Country code for target owner
22	67-68	SPAT	-1-99	Attritions probability* (i.e., percent change of attrition)
23	69	SSEQ	0-9	Sequential Warhead Number when operation code is 7, 10, or 11. Otherwise, blank.
24	70-71	SPTC	01-99	Plane type code
25	72-73	SWTC	01-99	Weapon type code
26	74-77	SUNT	0001-9999	Unit number (INDEXNO of launch base)
27	78-79		00-99	Sortie number
28	80			Blank
29	81-83	SGNM	001-999	Group number
30	84-89	SWNM	6 Alpha	Weapon type name
31	90-95	SLNM	6 Alpha	Launch site name

*A printed probability of -1 implies a value of 100.

Figure 42. (Part 2 of 3)

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
32	96-101	SLLT	DDMMSS	DD=degrees, MM=minutes, SS=seconds — Latitude of launch base
33	102		N or S	North or South
34	103-109	SLLN	DDDMMSS	DDD=degrees, MM=minutes, SS=seconds — Longitude of launch base
35	110		E or W	East or West
36	111-112	SLTM	00-23	Hours — Time of Launch
	113-114		00-59	Minutes
	115-116		00-59	Seconds
37	117-119	SAZM	000-999	Back Azimuth

Figure 42. (Part 3 of 3)

SORTIE SPECIFICATION: "A" CARD FORMAT

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
1	1		A	A-card indicator
2	2-4	ANNUM	001-999	A-card number
3	5-8	AUNT	0001-9999	Unit number
4	9-19	ASNO	01-99	Sortie number
5	11			Blank
6	12-14	APTC	001-999	Plane type code
7	15		0	
8	16-17			Blank
9	18		0	
10	19-22	AREF		Reference time (launch time in hours and minutes)
11	23		1	Time reference (1=launch)
12	24-30		0000000	
13	31-35			Blank
14	36-37	ALCC	2 Alpha	Country code of launch base
15	38			Blank
16	39-40	AFUN	1-9	SAGA Vehicle Function Code 1=ICBM 2=IRBM 3=MRBM 5=SSB/SSBN 6=SSGN 7=LRA 0, 4, 8, 9 not used
17	41		1 Alpha	Non-Executed Force Code

Figure 43. STRIKE Format (A and B Cards) (Part 1 of 4)

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
18	42			Blank
19	43-48	ATNN	6 Alpha	Weapon type name
20	49			Blank
21	50-55	ABNO	6 Alpha	Launch base BE Number
22	56			Blank
23	57-61			Sortie sequence number
24	62-80			Blank

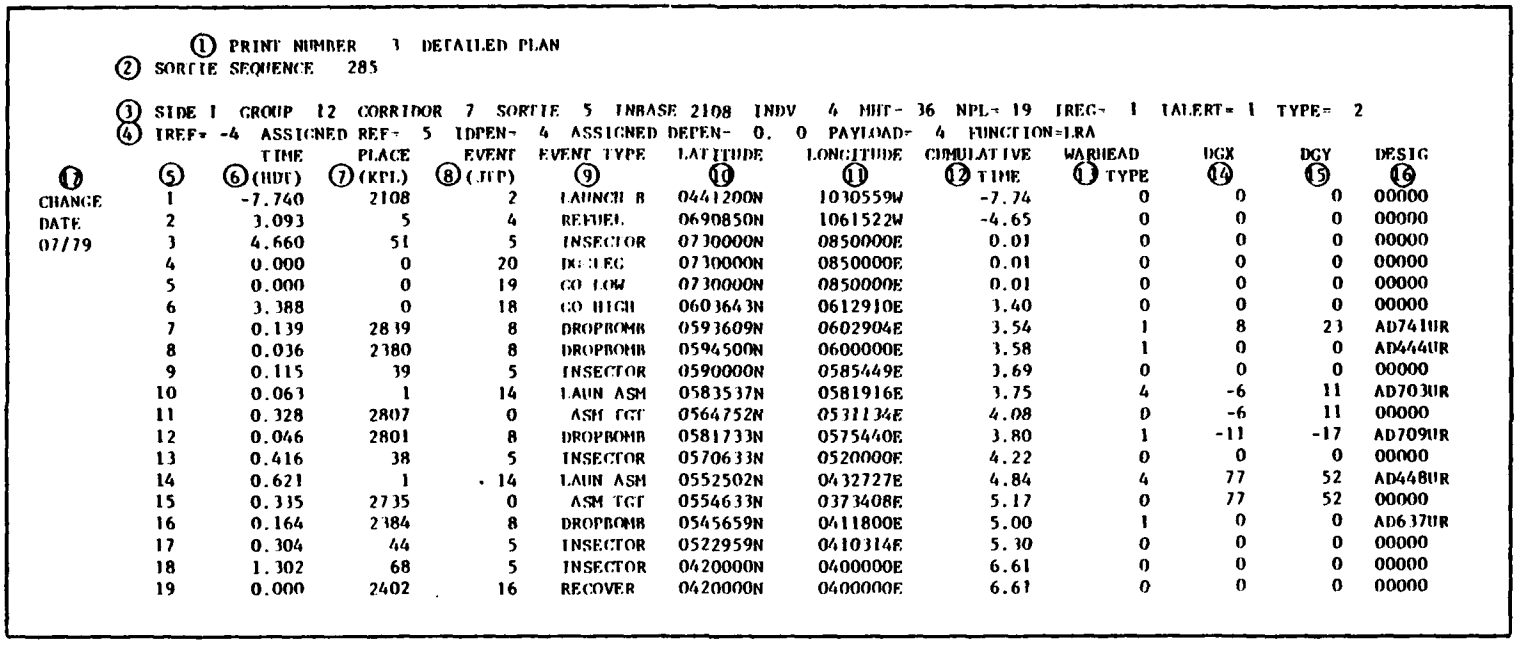
SORTIE SPECIFICATION: "B" CARD FORMAT

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
1	1		B	B-card indicator
2	2-4	BNUM	001-999	B-card number
3	5-8	BUNT	0001-9999	Unit number
4	9-10	BSNO	01-99	Sortie number
5	11-12	BFLN	01-99	Flight leg number
6	13-14	BEUT	01-14	Event or operation type indicator
			1	Takeoff
			2	Aerial refueling
			3-4	Dogleg
			6	ASM launch
			7	ASM on target
			8	Decoy release
			9	Decoy impact
			10	Missile or bomb on target
			11	MIRV on target
			13	Recovery if bomber; splash if air breathing missile
			14	Slash (ballistic missile)

Figure 43. (Part 2 of 4)

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
7	15-19	BLOC		Location identifier for given operation 1=Base index 2=Area number 6="1" 7=Target DESIG code 8 or 9="1" 10 or 11=Target DESIG code 13=Recovery base INDEXNO if bomber
8	20-25	BLAT	DDMMSS	Latitude at end of leg is degrees, minutes and seconds
9	26-33	BLON	DDDMMSSX	Longitude at end of leg is degrees, minutes, seconds, East or West
10	34	BMOD		Mode of operation
			1	High altitude
			4	Low altitude
11	35		0	
12	36-41	BTIM	HHMMSS	Time of event in hours, minutes and seconds
13	42		S	Southern latitude indicator (if latitude is North-blank)
14	43-44	BSEQ	01-99	Sequential index within unit number
15	45		0	
16	46			Blank
17	47-49	BAZI	000-360	Launch/Back azimuth in
18	50	BECM		ECM status
			0	Off
			1	On

Figure 43. (Part 3 of 4)



① PRINT NUMBER 3 DETAILED PLAN
② SORTIE SEQUENCE 285

③ SIDE 1 GROUP 12 CORRIDOR 7 SORTIE 5 INBASE 2108 INDV 4 MHT= 36 NPL= 19 IREG= 1 IALERT= 1 TYPE= 2
④ IREF= -4 ASSIGNED REF= 5 IDPEN= 4 ASSIGNED DEPEN= 0. 0 PAYLOAD= 4 FUNCTION=LRA

⑰	⑤	⑥ TIME (HDT)	⑦ PLACE (KPL)	⑧ EVENT (JTP)	⑨ EVENT TYPE	⑩ LATITUDE	⑪ LONGITUDE	⑫ CUMULATIVE TIME	⑬ WARHEAD TYPE	⑭ DGX	⑮ DGY	⑯ DESIG
CHANGE DATE 07/79	1	-7.740	2108	2	LAUNCH B	0441200N	1030559W	-7.74	0	0	0	00000
	2	3.093	5	4	REFUEL	0690850N	1061522W	-4.65	0	0	0	00000
	3	4.660	51	5	INSECTOR	0730000N	0850000E	0.01	0	0	0	00000
	4	0.000	0	20	DEFLEC	0730000N	0850000E	0.01	0	0	0	00000
	5	0.000	0	19	GO LOW	0730000N	0850000E	0.01	0	0	0	00000
	6	3.388	0	18	GO HIGH	0603643N	0612910E	3.40	0	0	0	00000
	7	0.139	2819	8	DROPBOMB	0593609N	0602904E	3.54	1	8	23	AD741UR
	8	0.036	2380	8	DROPBOMB	0594500N	0600000E	3.58	1	0	0	AD444UR
	9	0.115	39	5	INSECTOR	0590000N	0585449E	3.69	0	0	0	00000
	10	0.063	1	14	LAUN ASM	0583537N	0581916E	3.75	4	-6	11	AD703UR
	11	0.328	2807	0	ASM TGT	0564752N	0531134E	4.08	0	-6	11	00000
	12	0.046	2801	8	DROPBOMB	0581733N	0575440E	3.80	1	-11	-17	AD709UR
	13	0.416	38	5	INSECTOR	0570633N	0520000E	4.22	0	0	0	00000
	14	0.621	1	14	LAUN ASM	0552502N	0432727E	4.84	4	77	52	AD448UR
	15	0.335	2735	0	ASM TGT	0554633N	0373408E	5.17	0	77	52	00000
	16	0.164	2384	8	DROPBOMB	0545659N	0411800E	5.00	1	0	0	AD637UR
	17	0.304	44	5	INSECTOR	0522959N	0410314E	5.30	0	0	0	00000
	18	1.302	68	5	INSECTOR	0420000N	0400000E	6.61	0	0	0	00000
	19	0.000	2402	16	RECOVER	0420000N	0400000E	6.61	0	0	0	00000

Figure 50. Print Options 3 and 11: Detailed Bomber/Tanker Plan (Maintenance Print (Part 1 of 4)

HEADING	LABEL	DESCRIPTION
①	PRINT NUMBER	Print request number, as on print request card
②	SORTIE SEQUENCE	Sortie sequence number
③	SIDE	Side for which plan is generated: 1 = BLUE, 2 = RED
	GROUP	Weapon group index number, as assigned in program PLANSET
	CORRIDOR	Penetration corridor index number for weapon
	SORTIE	Sortie index number
	INBASE	Launch base index number
	INDV	Index to the individual vehicles on the base
	MHT	Total number of event lines in the plan
	NPL	Number of event lines
	IREG	Geographic command and control region index number
	IALERT	Index to alert status: 1 = alert, 2 = nonalert
	TYPE	Index to the weapon type table
④	IREF	Refueling index number: IREF Greater than 0 = Number of user-assigned refuel area 0 = No refuel -1 = Buddy refuel -2 = Buddy refuel: original number/squadron halved -3 = Air-breathing missile -4 = Single automatic refuel -5 = Two refuels required, both automatic
	ASSIGNED REF	Index of refuel area assigned if automatic tanker allocation is utilized
	IDPEN	Depenetration corridor index number
	ASSIGNED DEPEN	Depenetration corridor index number is reassigned here when last target is an ASM target; values are supplied for both primary and alternate sorties
	PAYLOAD	Index to payload table
	FUNCTION	Weapon function code

Figure 50. (Part 2 of 4)

FIELD	CARD COLUMNS	LABEL	RANGE	DESCRIPTION
19	51		0	
20	52-53	BWAR	01-99	Warhead type
21	54	BCRA		Height of burst 0=ground 1=air
22	55		0	
23	56-58	BPTC	001-999	Plane type code
24	59-60	BTCC	2 Alpha	Country code of target location
25	61	BRFC	1-9	Region code
26	62-64	BTSK	000-999	SIOP Table Number
27	65-68	BHOB	0000-9999	Height of burst (tens of feet)
28	69-73	BYLD	00001-99999	Yield (kilotons)
29	74-77	BCEP	0000-9999	CEP (tens of feet)
30	78-79	BCOW	2 Alpha	Country code for target owners
31	80	BATT	0-9	Attack increment

Figure 43. (Part 4 of 4)

4.3 Output

The output of PLANOUT can also be divided into three subsets relating to the three functions.

4.3.1 Sortie Completion Output. The output of the sortie completion function consists of additions to the integrated data base, in the form of additional sortie events and tanker sorties, and printed output. The printed output may be divided into four categories:

- o Standard output, which is printed regardless of the print option selected
- o Frequently used optional print -- 3, 10, 11 and 12 -- which are detailed bomber, missile and tanker plans, and the tanker allocation table
- o Debug print options
- o Error messages

4.3.1.1 Standard Output. First a list appears of the print options selected titling the list SNAP REQUESTS and putting appropriate headings on each column. Next, the input information on missile timing lines and CORMSLs is printed (see figure 44). A list of tanker bases is printed giving, for each base, the corresponding latitude (TKRLAT), longitude (TKRLONG), and tanker range (TRANGE), as shown in figure 45.

There are three printouts which give information used by PLNTPLAN's subroutine VAM. VAM applies Vogel's Approximation Method to the transportation problem of assigning available tankers to refuel areas where automatic tanker allocation is to be performed. These prints are output mainly for use by QUICK system programmers. The prints are:

a. The COST matrix, giving the contents of the FORTRAN array by the same name. Row i refers to tanker base i; column j to refuel area j. The entry in COST (i, j) is the distance between tanker base i and refuel area j. The matrix is printed up to 20 columns to a page.

b. The SOURCE/SINK table, printing for each integer i:

SOURCE(I) = N, where N is the number of tankers available for automatic allocation at tanker base I
SINK(I) = M, where M is the number of bombers which have been assigned to refuel at refuel area I

c. The VAM solution, showing the elements of the X(i, j) matrix which constitute the final feasible solution to the transportation problems. Again, i = the tanker base number, and j = the refuel area number. The value for X(i, j) = the number

HEADING	LABEL	DESCRIPTION
⑤	---	Sequence number of events within sortie plan (History table index) and a "C" if the event was changed
⑥	TIME (HDT)	Time between events in hours; in line one, the value represents the time from start of game
⑦	PLACE (KPL)	Represents the index numbers of launch bases, refuel areas, targets, and recovery points; for LAUNDCOY events, it is the number of decoys launched (if positive) or terminated (if negative); otherwise, KPL is zero
⑧	EVENT (JTP)	Index numbers to QUICK event codes
⑨	EVENT TYPE	Mnemonic indentifier of event

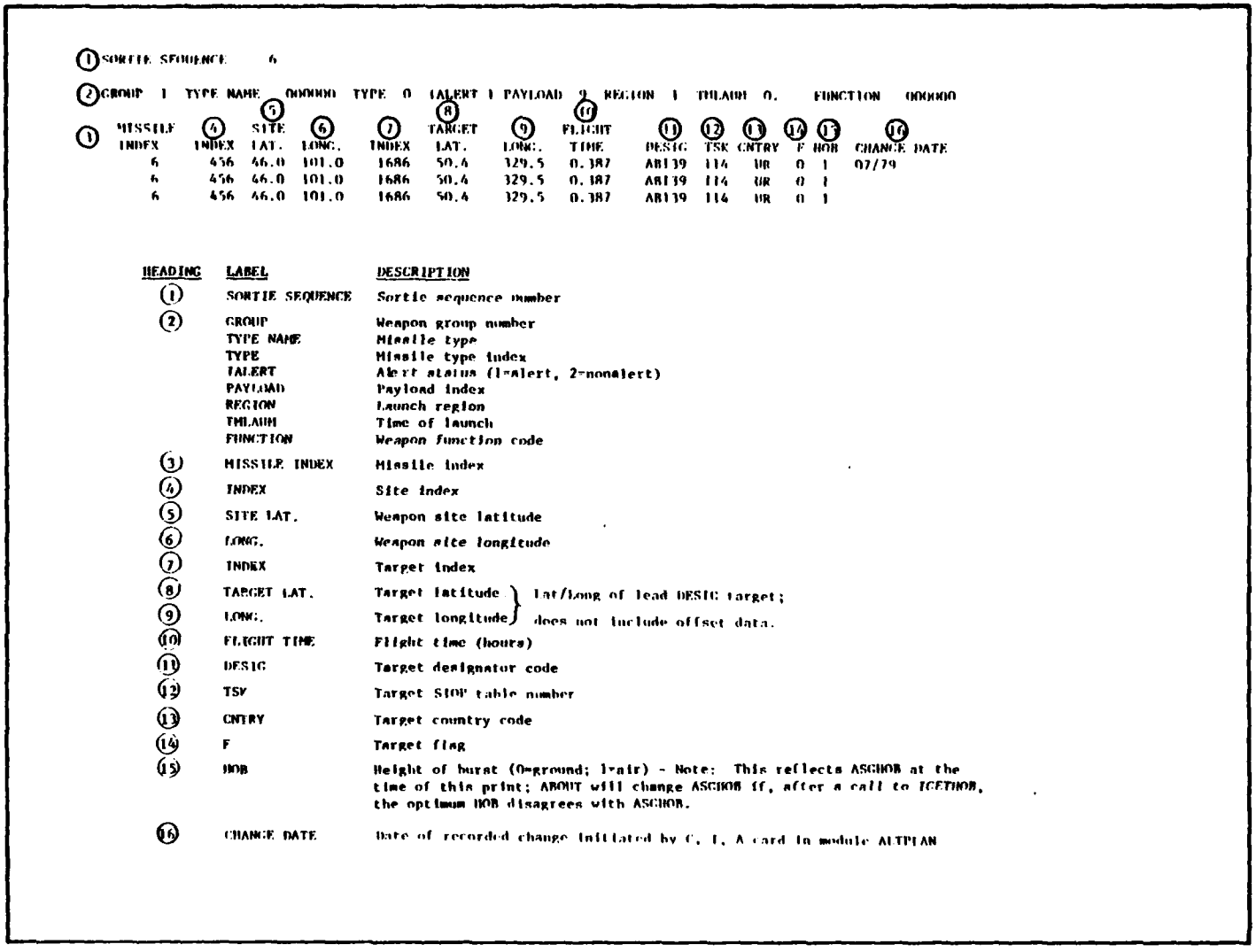
LAUNCH M = Launch missile
LAUNCH B = Bomber launch
REFUEL = Refuel
DROPBOMB = Drop bomb
MISATTR = Missile attrition event
ENTERREF = Enter refuel area (tankers)
LEAVEREF = Leave refuel area (tankers)
ABORT = Abort
LAUN ASM = Launch ASM
LAUNDCOY = Launch decoy
RECOVER = Recover
CHANGALT = Change altitude
GO HIGH = Go to high altitude
GO LOW = Go to low altitude
DOGLEG = Dogleg

Figure 50. (Part 3 of 4)

HEADING	LABEL	DESCRIPTION
(10)	LATITUDE	Latitude of event in geographic coordinates
(11)	LONGITUDE	Longitude of event in geographic coordinates
(12)	CUMULATIVE TIME	Cumulative time at each event
(13)	WARHEAD TYPE	Warhead index number; nonzero only for DROPBOMB OR LAUN ASM events
(14)	DGX	Target offset in fiftieth of nautical miles (positive west)
(15)	DGY	Target offset in fiftieth of nautical miles (positive north)
(16)	DESIG	Target Designator plus Country Location
(17)	CHANGE DATE	Date of recorded change initiated by C, I, A card in module ALTPLAN

If dropbomb or ASMTGT, coordinates are those of target lead DESIG

Figure 50. (Part 4 of 4)



(1) SORTIE SEQUENCE 6

(2) GROUP 1 TYPE NAME OOOOOO TYPE 0 TALERT 1 PAYLOAD 0 REGION 1 TMLAUN 0. FUNCTION OOOOOO

(1) MISSILE INDEX	(4) INDEX	(5) SITE LAT.	(6) LONG.	(7) INDEX	(8) TARGET LAT.	(9) LONG.	(10) FLIGHT TIME	(11) DESIG	(12) TSK	(13) CNTRY	(14) F	(15) HOB	(16) CHANGE DATE
6	456	46.0	101.0	1686	50.4	329.5	0.387	AB139	114	UR	0	1	07/79
6	456	46.0	101.0	1686	50.4	329.5	0.387	AB139	114	UR	0	1	
6	456	46.0	101.0	1686	50.4	329.5	0.387	AB139	114	UR	0	1	

HEADING	LABEL	DESCRIPTION
(1)	SORTIE SEQUENCE	*Sortie sequence number*
(2)	GROUP	Weapon group number
	TYPE NAME	*Missile type*
	TYPE	Missile type index
	TALERT	*Alert status (1=alert, 2=nonalert)*
	PAYLOAD	Payload index
	REGION	Launch region
	TMLAUN	Time of launch
	FUNCTION	*Weapon function code*
(3)	MISSILE INDEX	Missile index
(4)	INDEX	Site index
(5)	SITE LAT.	Weapon site latitude
(6)	LONG.	*Weapon site longitude*
(7)	INDEX	Target index
(8)	TARGET LAT.	Target latitude } lat/long of lead DESIG target;
(9)	LONG.	Target longitude } does not include offset data.
(10)	FLIGHT TIME	*Flight time (hours)*
(11)	DESIG	Target designator code
(12)	TSV	Target SIOP table number
(13)	CNTRY	Target country code
(14)	F	Target flag
(15)	HOB	Height of burst (0=ground; 1=air) - Note: This reflects ASCHOB at the time of this print; ABOUT will change ASCHOB if, *after a call to ICETHOB*, the optimum HOB disagrees with ASCHOB.
(16)	CHANGE DATE	Date of recorded change initiated by C, I, A card in module ALTPLAN

Figure 51. Print Option 10: Detailed Missile Plan (Maintenance Print)

TANKER ALLOCATION TABLE

① REFUEL AREA	② TIME OF EARLIEST ARRIVAL	③ NUMBER OF TANKERS ASSIGNED	④ NUMBER OF BOMBERS ASSIGNED	⑤ SURPLUS	⑥ LATITUDE	⑦ LONGITUDE
1	24,000	0	0	0	0650000N	1500000W
2	24,000	0	0	0	0630000N	0510000W
3	24,000	0	0	0	0630000N	0030000W
4	-4,879	105	14	91	0652929N	0902148W
5	-1,938	27	14	13	0890045N	0283353E
6	-6,890	52	7	45	0575738N	0632248W
7	-3,948	13	7	6	0623029N	0122700W
8	-4,702	37	5	32	0594839N	0655613W

Figure 52. Print Option 12: Tanker Allocation Table (Part 1 of 2)

11 PRINT DELETED--EXCEEDS 20 LINES A print 7 has been requested (precorridor legs), but the print 7 coding cannot handle more than 20 lines. Processing continues.

Figure 61. (Part 2 of 2)

1 ERROR. RANGE LIMITS EXCEEDED. MAX RANGE = (F7.1) CALCULATED RANGE = (F7.1) SORTIE SEQUENCE = (15) DESIG = (A5)

For the given sortie sequence number and DESIG, a missile or bomber is asked to exceed its range. May occur on an ACARD or due to a target change (CCARD) or addition (ICARD).

If the error results from an ACARD, no sortie is added. If it occurs from either a CCARD or ICARD, the change or insertion takes place. If the sortie involved is a bomber, PTP will be zero.

2 TIME CHANGE TOO LARGE. TIME CHANGED TO MAX OF (15) MINUTES SORTIE SEQUENCE = (I5)

A target time change request is too large; time is reset to maximum.

3 THE FOLLOWING (A5) CLAUSE HAS (A30) (I3) (A5) (A80)

Error in a sortie change clause

Field 1 contains either ACARD, CCARD or ICARD
Field 2 contains one of the following codes

a.	NO SORTIE NUMBER	- Sortie identifier missing
b.	NO DESIG	- ACARD has no target DESIG
c.	AN INVALID DESIG	- ACARD has non-existant DESIG
d.	AN INAPPROPRIATE DESIG	- ACARD has a non-lead or non-target list DESIG
e.	A MISSING COMMA	- Syntax error
f.	THE WRONG SYNTAX	- Syntax error
g.	NO GROUP NUMBER	- ACARD has no group number
h.	AN INVALID GROUP NUMBER	- Group number does not exist or is inappropriate
i.	NO BASE INDEX NUMBER	- ACARD base identifier missing
j.	AN IMPROPER OFFSET SYNTAX	- Syntax error
k.	AN INVALID MISSILE RANGE	- Target out of range or within missing range
l.	AN INVALID SORTIE NUMBER	- Sortie number does not exist
m.	AN INVALID FIRST DESIG	- Value for "desig1" invalid, sortie count wrong or DESIG does not exist
n.	AN INVALID SECOND DESIG	- Value for "desig2" does not exist
o.	AN IMPROPER OPTION SYNTAX	- Syntax error
p.	AN INVALID HOB	- Value entered for "hob" not a or G

Figure 62. Sortie Change Error Messages (Part 1 of 2)

q.	AN INVALID CORRIDOR NUMBER	- Value entered for "dec" out of range
r.	AN INVALID OPTION CODE	- Value entered for "rac" not valid
s.	AN INVALID TIME CHANGE	- Value for change not numeric
t.	AN INAPPROPRIATE FIRST DESIG	- Value given for "desig1" not lead target or not in target list
u.	AN INVALID OLD ASSIGNMENT	- Value given for "desig1" not a target in sortie
v.	AN INAPPROPRIATE SECOND DESIG	- Value for "desig2" could not be found in breakpoint tables built in FINDME. Call maintenance personnel.
w.	AN INVALID ASM CODE	- Value for "asm" not ASM

For all errors except AN INVALID SORTIE NUMBER: Field 3 contains the sequential count of the clause containing the error. This count includes all clauses not just sortie change clauses.

Field 4 and 5 contain a reconstruction of the clause

For AN INVALID SORTIE NUMBER error:

Field 3 contains the sortie number
Field 4 contains the card type and
Field 5 contains the clause 'FOR ALL CARDS WITH PRECEDING SORTIE NUMBER AND CARD TYPE'.

Figure 62. (Part 2 of 2)

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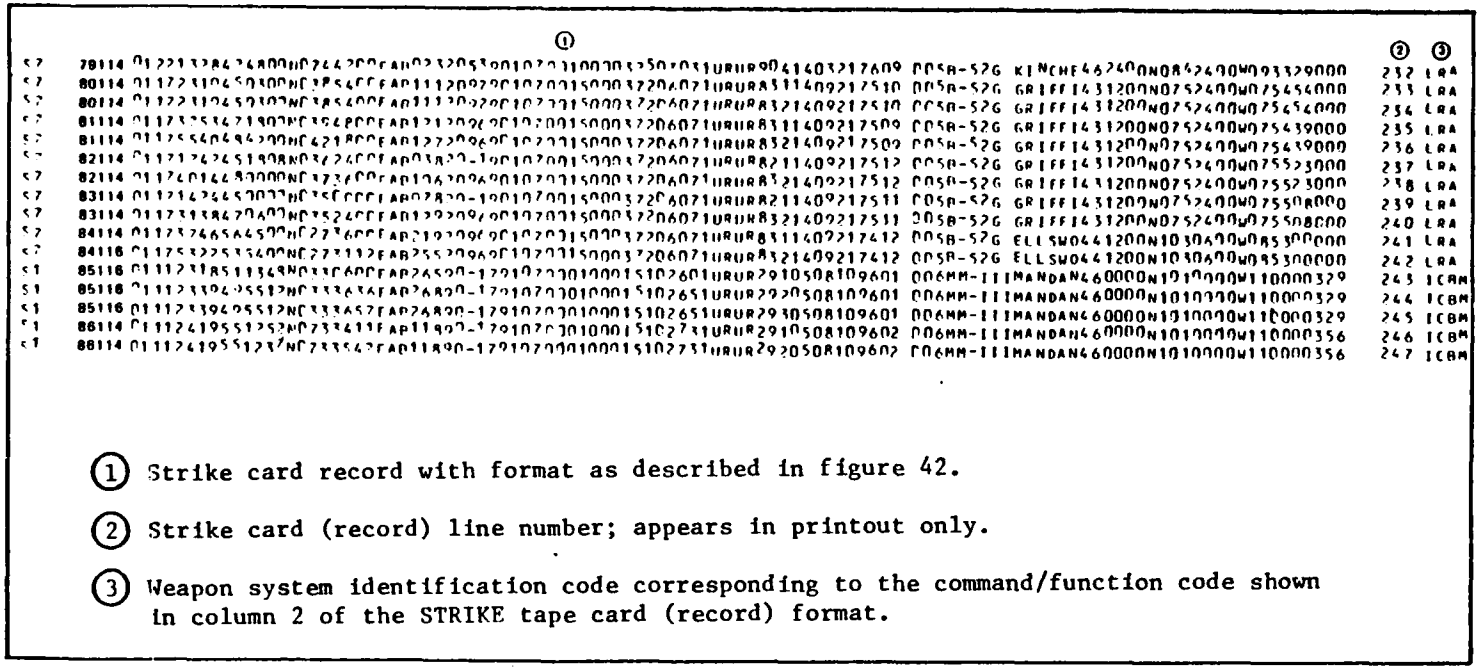
```
AD84217412 0140   00F5310000000       US 07  A-52G  AB 94      84                              1227
B0012174120301021744412001030600W10085300   0 0000000000014                         1          1228
B0022174120102000166417110763427W10115834   0 0000000000014                         1          1229
B0032174120203000060000000200000F10170238   0 0000000000014                         1          1230
B0042174120306000096000000200000E10170238   0 0000000000014                         1          1231
B005217412040 7AB22459186002436C0F10171713 010 000000910014UR1114 037201500060 7UR1          1232
B0062174120506000095930330240007E10171803   0 0000000000014                         1          1233
B00721741206 07AB113595652030370 7F10173811 020 000000910014UR1114 037201500060 7UR1         1234
B00E2174120704000005930330240007E40171803   0 0001000000014                         1          1235
B0092174120804000005800030180000E10180411   0 0001000000014                         1          1236
B0102174120904000005800030160000F10180411   0 0001000000014                         1          1237
B011217412101302488581200000600 00F10192843  0 0001000000014                        1          1238

AC85109601 0050   01100100000 00       US 01  MM-III AD772      85                             1239
B3011096010001910964600001010000W00110000   0 0280000000005                         1          1240
B0021096010111AB268495512033 3658F00112339 010 329000810005UR1118 015100100026 5UR1          1241
B0031096010211AB1294706003352400E00112430 020 331000810005UR1114 015100100027 5UR1          1242
B0041096010311AB03845175403C2354F00112502 030 332000810005UR1114 015100100028 2UR1          1243
```

Figure 63. ABTAPE Print



① ② ③

1. Strike card record with format as described in figure 42.
2. Strike card (record) line number; appears in printout only.
3. Weapon system identification code corresponding to the command/function code shown in column 2 of the STRIKE tape card (record) format.

Figure 64. STRIKE Tape Print

OFFENSIVE SYSTEM TABLE

① PLAN GEN TYPE NO.	② TYPE NAME	③ PLANE TYPE	④ NOBOMB1	⑤ IWHD1	⑥ NOBOMB2	⑦ IWHD2	⑧ NASM	⑨ IASM	⑩ NUMBER
			----------PAYLOAD CONFIGURATION----------						
2	B-58	17	1	3	3	1	0	0	64
1	MM_IA	1	1	1	0	0	0	0	150
0		23	0	0	0	0	0	0	720

LABEL	HEADING	DESCRIPTION
①	PLAN GEN TYPE NO.	Plan generator type number
②	TYPENAME	Weapon type name
③	PLANETYPE	Plane type number
④	NOBOMB1	Number of type 1 bombs
⑤	IWHD1	Type 1 warhead index
⑥	NOBOMB2	Number of type 2 bombs
⑦	IWHD2	Type 2 warhead index
⑧	NASM	Number of ASMs
⑨	IASM	ASM index
⑩	NUMBER	Number of offensive systems

Figure 65. The Offensive System Table

1	MULTIPLE STRIKE OR ABTAPE ADVERBS NOT ALLOWED Only one instance each of either STRIKE or ABTAPE clause is permitted in a single run of PLANOUT.
2	SETTING/IF ORDER WRONG SETTING/IF clauses must appear in pairs and in that order.
3	ERROR IN SETTING/IF PAIR (I3) Error has occurred in clause pair indicated. Most likely the spelling of a field name is wrong.
4	INTERFACE REQUIRES GAMETIME AND FUNCOM CLAUSES Both GAMETIME and FUNCOM clauses must appear in any valid run of the External interface function.
5	ERROR IN GAMETIME CLAUSE Check order and spelling of input flags.
6	ERROR IN FUNCOM CLAUSE Check clause syntax.
7	WARNING 2A6 IS NOT A LABEL An invalid label was input on a SETTING clause. Most likely the spelling of a LABEL (see figures 42/43) is wrong.

Figure 66. External Interface Error Messages

DISTRIBUTION

Addressee	Copies
CCTC Codes	
C124 (Reference and Records Set)	3
C124 (Stock)	6
C126	2
C313	1
C314	7
C630	1
DCA Code	
205	1
EXTERNAL	
Chief, Studies, Analysis and Gaming Agency, OJCS ATTN: SFD, Room 1D935, Pentagon, Washington, DC 20301	2
Chief of Naval Operations, ATTN: OP-654C, Room BE781 Pentagon, Washington, DC 20350	2
Commander-in-Chief, North American Air Defense Command ATTN: NPXYA, Ent Air Force Base, CO 80912	2
U.S. Air Force Weapons Laboratory (AFSC) ATTN: AFWL/SUL (Technical Library), Kirtland Air Force Base, NM 87117	1
Director, Strategic Target Planning, ATTN: (JPS), Offutt Air Force Base, NE 68113	2
Defense Technical Information Center, Cameron Station Alexandria, VA 22314	12
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